

What is claimed is:

1. A collision avoidance control system for a vehicle comprising:
a collision avoidance deceleration determining circuit
5 working to determine a target collision avoidance deceleration
required for a system vehicle equipped with this system to bring a
relative speed between the system vehicle and a target object present
ahead of the system vehicle into agreement with substantially zero
without a physical collision with the target object; and
10 a control circuit working to determine a possibility of collision
with the target object as a function of the target collision avoidance
deceleration, when the possibility of collision is higher than a given
threshold level, said control circuit performing a predetermined
collision avoidance operation.
15
2. A collision avoidance control system as set forth in claim 1,
wherein said collision avoidance deceleration determining circuit
determines the target collision avoidance deceleration G according to
an equation below

20

$$G = Vr^2 / \{ 2 \times (D - D_{fin}) \} - Ka \times Af$$

where Vr is the relative speed between the system vehicle and the
target object, D is a distance to the target object, D_{fin} is a minimum
25 distance to the target object that is to be reserved when the relative
speed Vr becomes zero (0), Af is acceleration of the target object, and

Ka is a gain ($0 \leq Ka \leq 1$).

3. A collision avoidance control system as set forth in claim 2,
wherein said collision avoidance deceleration determining circuit
5 decreases at least one of the minimum distance D_{fin} and the gain Ka
as the distance D increases.

4. A collision avoidance control system as set forth in claim 2,
wherein said collision avoidance deceleration determining circuit
10 decreases at least one of the minimum distance D_{fin} and the gain Ka
as one of a speed of the system vehicle and the relative speed V_r
decreases.

5. A collision avoidance control system as set forth in claim 1,
15 wherein when the target collision avoidance deceleration exceeds a
preselected alarm activating threshold value, said control circuit
activates an alarm to output an alarm signal, when the target
collision avoidance deceleration decreases below a preselected alarm
deactivating threshold value, said control circuit deactivating the
20 alarm to stop the alarm signal.

6. A collision avoidance control system as set forth in claim 1,
further comprising a travel control apparatus working to determine
a target acceleration as functions of a distance to the target object
25 and the relative speed and to decelerate or accelerate the system
vehicle based on the target acceleration to control a travel condition

of the system vehicle, and wherein the alarm activating threshold value is identical with a maximum deceleration controllable by the travel control apparatus.

5 7. A collision avoidance control system as set forth in claim 1, wherein when the target collision avoidance deceleration exceeds a preselected deceleration control activating threshold value, said control circuit performs deceleration control to decelerate the system vehicle, when the target collision avoidance deceleration
10 decreases below a preselected deceleration control deactivating threshold value, said control circuit deactivating the deceleration control.

8. A collision avoidance control system as set forth in claim 7,
15 further comprising a travel control apparatus working to determine a target acceleration as functions of a distance to the target object and the relative speed and to decelerate or accelerate the system vehicle based on the target acceleration to control a travel condition of the system vehicle, and wherein the deceleration control
20 activating threshold value is set greater than a maximum deceleration controllable by the travel control apparatus.